SECTION VII.—THE WEATHER AND DATA FOR THE MONTH.

WEATHER OF AUGUST, 1918.

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PRESSURE AND WINDS.

The distribution of the mean atmospheric pressure over the United States and Canada, and the prevailing direction of the winds for August, 1918, are graphically shown on Chart VII; while the means at the several stations, with the departures from the normal, are shown in Tables I and III.

At the beginning of August the pressure was below normal in the upper Lake region and over the Pacific Coast States. Elsewhere it was generally normal or slightly above. During the first decade there was no active cyclonic or anticyclonic movement, but pressure was relatively low over central and northern districts east of the Rocky Mountains and somewhat above normal in the Southeast. West of the Rocky Mountains pressure was on the whole near the normal, relatively high in northern districts and relatively low in southern districts. Early in the second decade higher pressure overspread most eastern sections and, except for short periods, pressure remained relatively high almost continuously throughout the decade, particularly in the northeastern districts. Here at the close of the decade it was more than half an inch above the normal, and effectually blocked the eastward progress of disturbances from the West. In the Middle West the pressure was generally below the normal during this decade, and in the far West it was near the normal. The high pressure that prevailed over northeastern districts at the beginning of the third decade gradually settled southward, and during most of the decade the pressure was normal or above over the southeastern States. Along the northern border east of the Rocky Mountains pressure was mostly below normal, several LOWS with their centers north of the United States having moved eastward during the decade. In other districts there was little storm activity and pressure remained generally close to the normal.

For the month as a whole the barometric pressure averaged slightly below the normal over a narrow strip from north-central Texas to the Canadian border, but elsewhere it was above the seasonal average, although departures were comparatively small. Over the maritime districts of Canada the monthly pressure was considerably above normal, and in the Northwest Provinces it was about the same amount below.

Due to the absence of important atmospheric disturbances there were few high winds, and the prevailing directions were not pronounced, although east of the Rocky Mountains they were mainly from southerly points. In the districts west of the Rocky Mountains they were mostly from some westerly point, particularly where the directions were not influenced by local topography.

TEMPERATURE.

The month opened with cool weather in the central and northern districts east of the Mississippi River, but it continued warm in the Plains region and the Southwest. The warm area moved slowly eastward with increasing intensity, and by the middle of the first decade covered the great central valleys. At points in Nebraska, Iowa, and adjoining States the maximum temperatures passed above the highest previously reported. During the 6th and 7th the hot wave overspread the Atlantic Coast States from the Carolinas to southern New England, and the highest temperatures of record were experienced at many points. At Atlantic City the maximum temperature of 104° was 5 degrees above the maximum record at that station for any month in the past 45 years.[1]

In the Gulf region, the extreme Northeast, and west of the Rocky Mountains, moderate temperature prevailed during this period, and cool weather set in over the far Northwest about the middle of the decade. During the next few days this cool area moved southeastward to the upper Lakes region, but the decade closed with the temperature continuing above the seasonal average generally, except along the New England coast and over the northern Rocky Mountain districts.

The first few days of the second decade were warm in the Eastern States, but there was a sharp fall in temperature in the upper Lake region and the upper Mississippi Valley, and it was somewhat cooler in the Missouri Valley and the southern Plains region. About the middle of the month cooler weather prevailed from the Ohio Valley and the Middle Atlantic States northward, but high temperatures continued in the east Gulf States, the maximum readings on the 15th and 16th exceeding the previous high record for August at several points in that area. Cool weather for the season prevailed during the next few days in the Northeastern States and also in the Central Plateau districts, and at the close of the decade it continued cool in the Lake region and the Atlantic coast district, but higher temperature prevailed in the central and southern Plains States. During the early part of the third decade it was generally warm east of the Mississippi River except in the Southeast, where some localities, particularly in Georgia, experienced on the morning of the 22d the lowest August temperature of record. Cool weather also set in about this time over the Rocky Mountain and northern Plains States. Shortly after the middle of the decade there was a decided rise in temperature in the upper Mississippi Valley and the Lake region, but over the far Northwest the temperature fell to below the seasonal average. Cooler weather prevailed in the upper Mississippi Valley during the last few days of the month, and there was a decided fall in temperature in the central Plains. At a number of points in the north Pacific States the maximum readings near the end of the month were higher than any heretofore recorded during August.

For the month as a whole temperature was below the normal in the extreme Northeast, and from the Rocky Mountains westward to the Pacific, except over small areas in the western portions of Washington and Oregon and in central and southwestern California. Elsewhere the temperature was above the seasonal average, the excess ranging from 3 degrees to 6 degrees a day from the central Plains States eastward nearly to the Atlantic coast. An average deficiency of about 3 degrees a day occurred throughout the greater part of the Plateau re-

[1] For a detailed description of this intensely hot spell, see pp. 361, this REVIEW.

gion, and from 3 degrees to 6 degrees a day along the immediate Pacific coast from northern California to Washington.

PRECIPITATION.

At the beginning of the month there were local rains in the upper Lakes and Plateau regions, and there were showers in the Southeast. Elsewhere generally fair weather prevailed. About the middle of the first decade local rains and thundershowers occurred from the central Rocky Mountain States northeastward to the Upper Lakes, in eastern and extreme western Texas, and in portions of New Mexico and Montana. During the remainder of the decade showers occurred in many localities from the Rocky Mountains eastward, with heavy falls in the Panhandle of Texas. On the 6th a severe tropical storm caused the loss of several lives and destroyed much property in southwestern Louisiana, but after passing inland its force rapidly dissipated.

The first few days of the second decade brought some heavy rains along the east Gulf coast, and a number of thunderstorms that occurred in widely separated localities from the Rocky Mountains eastward were accompanied by heavy rains at points in Pennsylvania, Ohio, and Minnesota. About the middle of the month showers occurred from the Ohio and upper Mississippi Valleys westward nearly to the Pacific, while light local rains fell in Texas and Louisiana, and from Maryland northward. The falls were heavy locally in the upper Mississippi Valley. During the next few days showers were quite general from the central and lower Mississippi Valley eastward, and also in the far Northwest, and the decade closed with more or less rain over the Gulf and South Atlantic States, the falls being heavy in the lower Mississippi Valley. At the same time local rains occurred in the northern Plains States and the upper Missouri Valley. During the first few days of the third decade rain fell in some sections of the Gulf States and in many localities from the Lake region westward to the Rocky Mountains, the amounts being large at points in Minnesota and North Dakota. Generous to heavy showers were received also over considerable areas from Kansas and Missouri southward. About the middle of the decade rain occurred locally in the districts from the Rocky Mountains eastward, and was generally light except in eastern North Carolina and at points in the Ohio and middle Mississippi Valleys and in Texas. During the latter part of the month rain fell over large areas east of the Mississippi River, and also in the lower Missouri Valley, Arkansas, and the eastern portions of Kansas and Oklahoma, the falls being heavy in portions of the east Gulf States and the Ohio Valley.

For August as a whole the precipitation was heavy in the coastal portion of the central and eastern Gulf States, in eastern North Carolina, and in portions of the central and upper Mississippi Valley and Middle Atlantic States. Elsewhere over the eastern half of the country rainfall was generally moderate to light. From the Rocky Mountains westward the rainfall was light, except over a few limited areas, while in small portions of Utah and Nevada and over much of central California no precipitation occurred.

RELATIVE HUMIDITY.

The continued hot weather in the southern Plains region and thence northeastward and eastward was reflected in the relative humidity, which was below normal over nearly all the eastern two-thirds of the country, the deficiency amounting to from 10 to 20 per cent in the middle and southern Great Plains. There was a slight deficiency along the immediate Pacific coast, but in the Rocky Mountains and Plateau States the relative humidity was somewhat higher than normal.

GENERAL SUMMARY.

For August as a whole the weather was generally favorable for farm work. Corn as a rule made good progress in most northern and eastern sections, but in the more central and southern districts the intense heat and dry weather caused much deterioration. During the early part of the month the weather was generally favorable for cotton in the eastern portion of the belt, but as a whole it was too dry in most sections until near the end of the month, and the general growth of cotton was unsatisfactory. The harvesting and thrashing of spring wheat progressed favorably and the crop was generally good. Oats and other small grains were likewise harvested with satisfactory yields. The weather was unfavorable for potatoes and truck crops in the Central and Southwestern States, but elsewhere these crops generally made good progress. Meadows and pastures as a rule were in good condition, except in the more central sections, where they were unfavorably affected by the dry weather and high temperatures. Fruits made satisfactory progress and the outlook was good in the main producing centers.

SEVERE LOCAL STORMS.

The following note of a severe storm has been extracted from the official Weather Bureau report:

Minnesota.—The most destructive tornado that has visited the State in many years struck Tyler, Lincoln County, on August 21, 1918, at 9:20 p. m., demolished most of the business portion of the town, and caused the loss of 36 lives and nearly a million dollars' worth of property.

Average accumulated departures for August, 1918.

Districts.	Temperature.			Precipitation.			Cloudiness.		Relative humidity.	
	General mean for the current month.	Departure for the current month.	Accumulated departure since Jan. 1.	General mean for the current month.	Departure for the current month.	Accumulated departure since Jan. 1.	General mean for the current month.	Departure from the normal.	General mean for the current month.	Departure from the normal.
	°F.	°F.	°F.	In.	In.	In.	0-10.		P. ct.	
New England	67.8	+0.8	− 8.5	3.09	−0.80	− 5.30	4.9	−0.2	75	− 6
Middle Atlantic	75.6	+2.8	− 0.6	2.61	−1.90	− 4.10	4.6	−0.5	74	− 3
South Atlantic	79.6	+1.8	+ 4.5	3.91	−2.20	−11.20	4.3	−0.9	78	− 4
Florida Peninsula	82.8	+0.4	+ 4.0	3.80	−3.20	−13.40	5.2	−0.2	75	− 4
East Gulf	80.5	+1.3	+ 7.3	6.21	+1.30	− 4.80	5.0	−0.1	76	− 4
West Gulf	83.8	+2.8	+ 7.8	1.82	−1.20	− 8.10	4.0	+0.1	78	+ 3
Ohio Valley and Tennessee	79.0	+4.6	+ 0.3	3.45	0.00	− 4.10	4.8	+0.3	69	− 4
Lower Lakes	72.8	+3.1	− 3.4	2.14	−0.90	− 3.30	4.6	0.0	68	− 4
Upper Lakes	68.7	+2.4	− 5.6	1.98	−1.00	− 2.80	4.8	0.0	73	− 3
North Dakota	67.4	+0.4	+11.9	3.36	+1.10	− 2.10	4.0	−0.2	68	+ 1
Upper Mississippi Valley	77.0	+4.1	+ 3.3	4.01	+0.80	− 1.70	4.9	+0.6	69	− 2
Missouri Valley	78.6	+4.8	+14.7	2.65	−0.70	− 5.10	4.0	−0.2	62	− 5
Northern slope	65.8	−0.9	+ 5.9	1.42	+0.10	+ 1.00	4.2	+0.3	58	+ 3
Middle slope	79.5	+4.2	+11.5	2.15	−0.30	− 1.60	3.9	0.0	51	−11
Southern slope	81.5	+2.4	+13.7	1.76	−0.90	− 5.30	2.9	−0.9	52	−11
Southern Plateau	75.1	−2.2	− 0.8	1.51	+0.20	− 0.10	3.2	−0.4	50	+ 6
Middle Plateau	69.5	−2.1	+ 1.6	0.62	−0.10	− 1.20	2.8	−0.2	40	+ 1
Northern Plateau	66.8	−3.6	+10.2	0.75	+0.40	− 1.20	4.2	+1.5	48	+ 6
North Pacific	62.2	+0.3	+ 6.9	1.74	+1.00	− 2.30	5.3	+0.7	76	0
Middle Pacific	66.0	+1.1	+ 4.4	0.06	0.00	− 6.50	0.3	−3.0	58	− 4
South Pacific	71.7	+1.2	+13.5	0.04	0.00	+ 2.50	2.5	−0.1	65	0

WEATHER CONDITIONS OVER THE NORTH ATLANTIC OCEAN DURING AUGUST, 1917.

The data presented are for August, 1917, and comparison and study of the same should be in connection with those appearing in the Review for that month.

Chart IX (XLVI—71) shows for August, 1917, the principal storm tracks and the averages of pressure, air temperature, water-surface temperature, and prevailing direction of the wind at 7 a. m. 75th Meridian Time (Greenwich mean noon).

PRESSURE.

The distribution of the average pressure for the month presented few unusual features, as the North Atlantic or Azores HIGH was practically normal in position, although of slightly greater intensity than usual. The Icelandic LOW was well developed, the center being near the north coast of Scotland, where the mean pressure was 29.62 inches, which is considerably below the normal.

Over the western division of the ocean the pressure changes from day to day were not unusually great, while in the waters adjacent to the coast of Europe the variations and extremes were comparatively large, as shown in the following table, which gives for a number of 5-degree squares the mean pressure for each of the three decades of the month, as well as the highest and lowest individual readings reported within the respective squares.

Pressure over North Atlantic Ocean during August, 1917, by 5-degree squares.

Position of 5-degree squares.		Decade means.			Extremes.			
					Highest.		Lowest.	
Latitude.	Longitude.	I	II	III *	Pressure.	Date.	Pressure.	Date.
°	°	*Inches.*	*Inches.*	*Inches.*	*Inches.*	*August.*	*Inches.*	*August.*
60–65 N	20–25 W	29.85	29.71	29.66	30.10	2	29.40	23
60–65 N	0– 5 E	29.96	29.63	29.52	30.20	4	29.20	29
55–60 N	35–40 W	30.01	29.98	29.90	30.32	6	29.82	29
55–60 N	10–15 W	29.84	29.62	29.48	30.22	1	29.05	23
50–55 N	25–30 W	30.01	30.01	29.90	30.12	18	29.70	27
50–55 N	0– 5 W	29.83	29.74	29.58	30.00	1,20	28.90	28
45–50 N	65–70 W	30.00	30.05	29.98	30.30	5	29.70	25
45–50 N	40–45 W	30.12	30.16	30.15	30.51	6	29.80	1
45–50 N	10–15 W	30.00	29.97	29.92	30.21	1	29.50	27
40–45 N	50–55 W	30.10	30.18	30.20	30.39	22	29.78	1
40–45 N	25–30 W	30.18	30.23	30.24	30.41	17	30.09	28
35–40 N	75–80 W	30.03	30.05	30.01	30.26	27	29.70	24
35–40 N	35–40 W	30.19	30.28	30.32	30.42	26	30.02	2
35–40 N	10–15 W	30.11	30.10	30.17	30.30	24	29.96	22
30–35 N	50–55 W	30.12	30.25	30.23	30.36	12	30.01	1
30–35 N	25–30 W	30.22	30.25	30.29	30.40	16,26	30.10	18,21
25–30 N	90–95 W	30.04	29.99	29.97	30.18	8	29.88	23
25–30 N	60–65 W	30.10	30.17	30.14	30.29	15	30.02	5
25–30 N	15–20 W	30.14	30.13	30.13	30.28	9	29.99	21
15–20 N	35–40 W	30.01	30.06	30.05	30.21	15	29.97	5,24
10–15 N	80–85 W	29.90	29.90	29.92	29.99	26	29.86	3,14

* Mean of last 11 days of the month.

The mean values presented in the above table are based on the interpolated daily pressure for each square on the MS. daily synoptic chart of the North Atlantic Ocean compiled by the Marine Section of the Weather Bureau.

GALES.

Gales occurred on two days in the latter part of the month over a limited area in the northeast section of the ocean; they were not reported on more than one day in any other 5-degree square, and the month was entirely free from tropical hurricanes.

From August 1 to 4 an area of slight atmospheric depression was in the vicinity of the Gulf of St. Lawrence, where light to moderate winds and fog prevailed. During the same period there was also a LOW of much greater intensity over the English Channel and North Sea, that remained nearly stationary. It was impossible to determine the conditions of wind and weather, due to the lack of vessel reports from that locality.

From the 5th to the 8th the atmospheric condition was sluggish, with weak gradients and light winds. On the 9th a LOW was central over the English Channel, and at the same time the Azores HIGH with a crest of 30.33 inches, was unusually well developed, while moderate northwest gales prevailed over the central portion of the steamer lanes. The LOW remained nearly stationary until the 15th, and the movement of the HIGH was likewise slight and irregular. While the intensity of these areas did not vary materially from day to day, the wind velocity decreased, as no gales were reported between the 10th and the 15th.

On the 17th a moderate LOW (1 on Chart IX) was central near Hatteras, where the barometer reading was 29.82 inches. This depression moved northeastward along the coast, and on the 18th the center was near Cape Cod. It then increased its rate of translation, curved toward the east, and was off the coast of Newfoundland on the 19th. Light to moderate winds accompanied the LOW during its movement from the 17th to the 19th, and fog was reported on the latter date off the south coast of Nova Scotia. On the 21st there were slight depressions in the Gulf of St. Lawrence and near the west coast of Ireland, respectively, and one vessel near latitude 51°, longitude 37°, encountered a moderate northeasterly gale. The European LOW remained nearly stationary until the 27th, increasing in intensity, and on the 23d and 24th westerly gales of from 40 to 50 miles an hour prevailed in the southern part of the Irish Channel. On the 27th the center of this disturbance (LOW II on Chart IX) was near Valentia, Ireland, where the barometer reading was 29.03 inches; the highest wind velocities of the month were reported on this date, occurring between the 45th and 50th parallels and the 12th meridian and the French coast, where vessels encountered westerly and southwesterly gales of from 50 to 65 miles an hour. LOW II moved in a northeastward direction and on the 28th surrounded the east coast of England; the barometer reading at Shields of 28.68 inches was the lowest recorded during the month, and northwesterly gales of from 40 to 50 miles an hour prevailed in the southwest quadrant. The LOW then curved sharply toward the north, and on the 29th surrounded the Shetland Islands; it had decreased slightly in intensity since the previous day and was accompanied by light to moderate winds. It then recurved toward the northeast, continuing to decrease in intensity, and on the 30th the center had reached a point near Kristiansund, Norway. Light to moderate winds apparently still prevailed, although it was impossible to determine the conditions accurately on account of lack of sufficient observations.

AIR TEMPERATURES.

The mean monthly temperature of the air as compared with the normal varied considerably over different divisions of the North Atlantic. Positive departures of from 2 to 4 degrees occurred over the northern steamer lanes between the 35th parallel and the American coast,

while over the eastern division the air temperatures were nearly normal, as they also were in the Gulf of Mexico. Small negative departures were the rule over limited areas in midocean, and between the Azores and the Madeiras, while in the region of the northeast trades it was considerably warmer than usual, the departures ranging from +3° to +5°.

The change in temperature from day to day was not especially marked, and the greatest range occurred in the square that includes the east coast of Labrador, where the thermometer reading was 49° on the 3d and 59° on the 18th and again on the 25th.

The following table gives the temperature departures at a number of Canadian and United States Weather Bureau Stations on the Atlantic and Gulf coasts:

	°F.		°F.
St. Johns, New Foundland	+5.4	Norfolk, Va	+1.1
Sydney, Cape Breton Island	+2.7	Hatteras, N. C	+0.6
Halifax, Nova Scotia	+3.4	Charleston, S. C	−0.1
Eastport, Me	+0.5	Key West, Fla	−0.2
Portland, Me	+0.7	Tampa, Fla	+1.4
Boston, Mass	+3.9	Mobile, Ala	+1.3
Nantucket, Mass	+1.2	New Orleans, La	+1.6
Block Island, R. I	+1.9	Galveston, Tex	+0.9
New York, N. Y	+2.4	Corpus Christi, Tex	+0.7

WATER-SURFACE TEMPERATURES.

The mean temperature of the water at the surface varied but little from that of the air, as shown by the isotherms on Chart IX. The temperatures of the two elements as compared with the normal were, as a rule, also similar, although off the Canadian coast the positive departures of the water temperatures were somewhat larger than those of the air, while in the waters adjacent to the coast of New England the conditions were reversed.

FOG.

Off the Banks of Newfoundland the normal percentage of fog in August ranges from 40 to 45, while for the month under discussion it was observed in that region on only 2 days, a percentage of 6. In the area between the 40th and 45th parallels, and the 60th meridian and the North American coast, fog was reported on 6 days, a percentage of 16, which is only slightly below the normal. Fog occurred on from 1 to 3 days over the western part of the steamer lanes, while over the central and eastern divisions it was comparatively rare.

Winds of 50 mis./hr. (22.4 m./sec.) or over, during August, 1918.

Station.	Date.	Velocity.	Direction.	Station.	Date.	Velocity.	Direction.
Columbus, Ohio	8	50	sw.	Pierre, S. Dak	28	68	n.
Do	12	72	s.	Point Reyes Light, Cal	3	54	nw.
Hatteras, N. C	24	58	sw.	Do	4	59	nw.
Do	25	64	sw.	Richmond, Va	12	52	nw.
Lexington, Ky	6	72	s.	St. Joseph, Mo	30	60	nw.
Mount Tamalpais, Cal	14	56	sw.	St. Louis, Mo	12	50	s.
New York, N. Y	14	54	nw.	Springfield, Mo	30	58	nw.
Pensacola, Fla	10	53	nc.	Toledo, Ohio	8	52	sw.
Pierre, S. Dak	27	62	nw.				